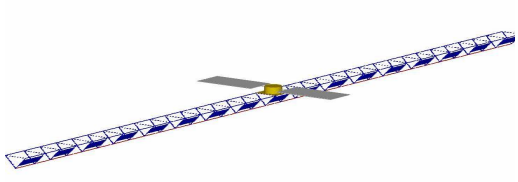
Innovative Space-based radar Antenna Technology (ISAT) Flight Demonstrator

FACT SHEET Air Force Research Laboratory Space Vehicles Directorate 505.846.4704/4321 www.vs.afrl.af.mil

Administered by the Air Force Research Laboratory's Space Vehicles Directorate, Kirtland Air Force Base, N.M., the Innovative Space-based radar Antenna Technology (ISAT) program concentrates on developing systems to deploy extremely large (up to 300 yards) electronically scanning radar antennas flying 5,700 miles above the Earth's surface and providing ground target detection to the warfighter. When launched in 2010, the football field in length ISAT demonstrator, weighing over five tons, will serve as the forerunner for the future of America's intelligence, surveillance, reconnaissance (ISR) assets in space.

Initiated in 2002, and sponsored by the Defense Advanced Research Projects Agency (DARPA), the ISAT program also involves participation by the AFRL's Sensors and Information Directorates, as well as by the National Aeronautics and Space Administration's Langley Research Center and Jet Propulsion Laboratory. In addition, two contractor teams, The Boeing Co. and Raytheon Co., as well as Lockheed Martin Corp. and Harris Corp., are competing to construct the 100-yard sized flight demonstrator. Following the spacecraft's critical design review process in June 2006, DARPA, with recommendations from the Space Vehicles Directorate, will choose one of the contractor pairings to advance the project.

Operated out of the Space and Missile Systems Center's Detachment 12, also located at Kirtland AFB, the Department of Defense's Space Test Program will provide the evolved expendable launch vehicle flight opportunity, referred to as STP-2, to propel the large, foldable ISAT flight demonstrator into low Earth orbit, approximately 620 miles above the planet. Det. 12 will also operate the spacecraft from the Research, Development, Test and Evaluation (RDT&E) Support Complex at Kirtland AFB. Before the planned lift off occurs at Cape Canaveral, Fla., in four years, the ISAT spacecraft will be developed, integrated, and tested at the contractor facility with oversight provided by the Space Vehicles Directorate.



Technologies to be developed and demonstrated on the ISAT flight experiment include advanced antenna architectures and structures; lightweight radiation-hardened materials and electronics; reliable deployment technologies and mechanisms; compressible components and materials; as well as advanced metrology and calibration concepts for larger radar antennas. The multi-million dollar program's primary goal is supporting the warfighter through development of tactical grade, ground-moving target indication (GMTI) capability. This ISR tool will enable the tracking and identifying of targets with precise resolution and scanning in multiple areas of interest.

To ensure the demonstrator's successful one-year mission, the ISAT management team is focusing on four specific project areas: structures, radar, metrology and calibration, as well as systems engineering, integration, and testing. Due to the antenna's large size, which prevents ground testing of the integrated system prior to launch, there is an unprecedented emphasis on modeling, simulation, and ground-based, risk-reduction demonstrations. These will play a crucial role in the flight demonstrator's outcome.

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